APPLICATION NOTE

FLOW MEASURMENT CONFIGURATION FOR SMARTSCAN25 AND SMARTSCAN50 FOR STANDARD AND CUSTOM FLUMES

Revision Record:

Date	Description	Written by	Rev.
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TABLE OF CONTENTS

LIST OF TABLES

1.   SCOPE

This document defines the configuration procedure of **SmartScan** unit for measuring open channel (flow) for standard and custom flumes. The term **SmartScan** is used in this document for both **SmartScan25** and **SmartScan50**).

2.   OBJECTIVES

- Familiarize the user with configuring the **SmartScan** unit to support flow measurement from the main menu.

- Familiarize the user with configuring the **SmartScan** unit to support standard or custom flumes.

3. PREPARATIONS

Before working with the SmartScan unit verify that:

1. The **SmartScan** unit is connected to a DC power source using an appropriate power cord.

2. The power is turned on.

For Open Channel / Flow measurements you first need to verify that the **SmartScan** unit is configured to work with *liquids* and not with *solids*.

When the **SmartScan** is turned on, make sure the application indication on the lower left side of the LCD is *Liquid* and not *Solid*.

4. MAIN MENU CONFIGURATION

Assuming **SmartScan** is configured for *liquid* you can configure the **SmartScan** for Open Channel/flow measurements. Please review table#1.

Table#1: Entering SmartScan in main menu.

Step	Action	Remark
1.	While the SmartScan is operating regularly, **press <Ent>+<Esc> simultaneously**.	This will bring you into the configuration menus.
2.	Now type in the requested password. The prompt is: CO-000.	Using the keypad, **type in the code 716.**
3.	**Select '1' and press <Ent>** for selecting single sensor mode.	
4.	**Select '3' and press <Ent>** for entering the main menu screen.	You should now see the main menu screen where most of the configuration is done. The word **DIST**. flashing indicates that that you are in the main menu screen. We will return to this main menu at a later phase.

We shall now review each and every parameter appearing on the main menu screen. A parameter irrelevant for your application will be ignored. Parameters that are important for open channel / flow measurement will be discussed.

To ignore a certain parameter, do not press **<Ent>** on it. Simply press the <**Next**> key to move to the next parameter.

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December 31, 2002 |

Only relevant parameters should be select using the <Ent> key. Once you have entered a value for a relevant parameter, an animation of the graph bar will confirm that a selection has been made.

Please review table #2 for discussing relevant parameters.

Table#2: Configuring SmartScan main menu.

Step	Parameter	Remark
1.	Dist.	For distance measurement only. Skip using <Next> to the next parameter.
2.	Level.	For level measurement only. Skip using <Next> to the next parameter.
3.	Flow	For flow measurement. **Select by pressing <Ent>.**
4.	Meter	For distance/level measurement only. Skip using <Next> to the next parameter.
5.	Inch	For distance/level measurement only. Skip using <Next> to the next parameter.
6.	Feet	For distance/level measurement only. Skip using <Next> to the next parameter.
7.	M^3/HR	For flow measurement with M^3/HR units. **Select by pressing <Ent>.**
8.	G.P.M	For flow measurement with G.P.M units. **Select by pressing <Ent>.** Ignore if you selected M^3/HR.
9.	Relay	For relay definitions. ON the assumption that no relays are needed so we can skip using <Next> to the next parameter.
10.	20mA	Relevant for the analog 4-20mA output. **Add a flow value corresponding to the maximum flow level.**
11.	4mA	Relevant for the analog 4-20mA output. **Add a flow value corresponding to the minimum flow level.**
12.	PARSH.FLUM	Enables definition of pre-select flume (with a parameter or defining our own flume). **Select by pressing <Ent>.** For an explanation in regards of this parameter review paragraph 6.

You should now continue from the PARSH.FLUM PARAMETER (already defined, as described in paragraph 5).

13.	PARSH.FLUM	Should be configured as explained in paragraph six.
14.	Tank	**Enter the maximum depth to be measured by the unit (the furthest point from the sensor).**
15.	Flow	For flow measurement. **Select by pressing <Ent>**.

Since all other parameters after the flow parameter are irrelevant for our application so it is suggested to reset the unit by turning the power off.

Flow measurement configuration for
SmartScan25 and SmartScan50 for
standard or custom flumes

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December 31, 2002

When turning the device on again, it should be in flow measurement mode.

The indications you should see are these:

1. FLOW mode (above the measurement reading value) is active and not level or distance.

2. Units should be M3/HR.

3. On the lower left corner you can see the mode is Liquid and Flow and not Solid.

4. None of the modes 'Storage I', 'Storage II', 'Process' are active as they are not relevant for flow measurement.

5. PARSH.FLUM CONFIGURATION:

By pressing <Ent> on the PARSH.FLUM parameter you should see the following string:

.XYY

For defining a standard flume according to the tables represented in the **user manual in pages 61-70** press the appropriate X and YY code where X is the flume type (each type represent a different table) and YY represent flume measurement (such angle, depth, etc.).

For defining a custom flume (in case your flume is not one of the predefined flumes) in the user manual, you should select the following code:
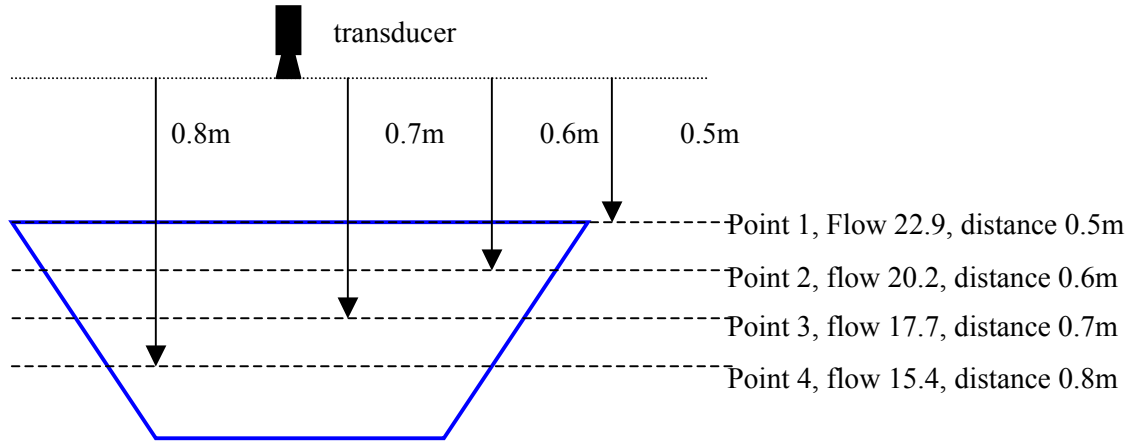
.001

Select your choice by pressing <Ent>.

You will now switch into the sub-routine that enabling you to define your own flume. A flume can be defined with a minimum 8 points and up to 24 points, each point described by:

- The point distance of the point from the transducer.

- The value of flow corresponding to the distance previously entered.

To summarize it graphically, for the following flume (flume drawn in blue):

The values should be typed as follow:
- **Point number** – automatically represented.
- **Distance** from transducer: ###.### [meters].
  For example, 15.4 meter should be entered 015.400meter.
- **Flow value** should be entered in two separate screens:
  - First screen is for low-resolution number [######].
  - Second screen is for high-resolution number (including decimal points). [###.###]

For example: If we wish to enter the value 1284.560

We shall put 001284 in the first screen and press enter.

After advancing to the second screen we shall see the last three digits of the whole numbers and the decimal dots: 284.000. This value must be displayed as 284.560.

Another example:

The following points must be defined:

Point	Distance	Flow
1.	0.535m	22.9
2.	0.545m	20.2
3.	0.555	17.7
4.	0.565	15.4

The order of placing the values is:

P 1 DIST: 000.535 [m] Flow Screen 1: 000022 m3/hr Flow Screen 2: 022.900 m3/hr
P 2 DIST: 000.545 [m] Flow Screen 1: 000020 m3/hr Flow Screen 2: 020.200 m3/hr
P 3 DIST: 000.555 [m] Flow Screen 1: 000017 m3/hr Flow Screen 2: 017.700 m3/hr

Etc.

6. TESTING THE CONFIGURATION

It is easy to verify that the configuration is set properly.

Place the **SmartScan** sensor against the wall at a distance from one of the points you entered in PARSH.FLUM mode.

For example if one of the points entered as:

P 2

DIST: 000.545 [m]

Flow Screen 1: 000020 m3/hr

Flow Screen 2: 020.200 m3/hr

Place the sensor 0.545 meters from the wall and verify the **SmartScan** display the value 20.2.